The Excavating Engineer

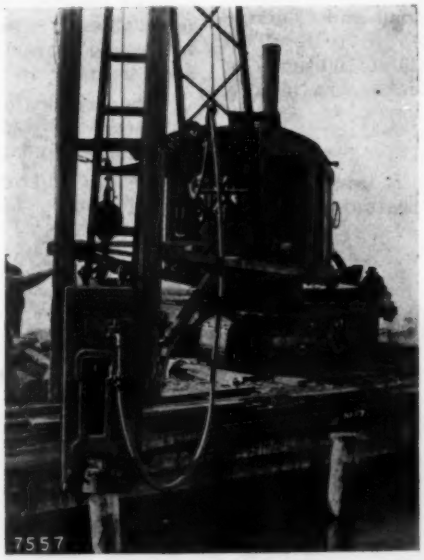
Vol. 19 MAY 1925 No. 5

Using a Small Revolving Shovel as a Pile Driver

Conners' Florida Highway, Inc., Makes Novel Use of Two Bucyrus 20-B Shovels While Building Harding Memorial Bridge

THE Everglades of Florida, that huge morass which has defied exploration for so long, has only recently begun to yield its fertile land to cultivation. Roads traverse what was formerly wilderness, and the beautiful Lake Okeechobee merely forms part of the itinerary of the sightseeing tourist.

The Conners' Florida Highway, Incorporated, have recently completed a bridge for the Florida State Road Department across the Kissimee River, flowing southwest into the northern shore of Lake Okeechobee; this bridge, 3200 feet long, twenty feet wide, with a 152-foot draw span, is known as the Harding Memorial Bridge, and traverses a stretch where open water and treacherous, black, slimy ooze vie with one another for occupancy of the limestone basin which underlies most of the Everglades.



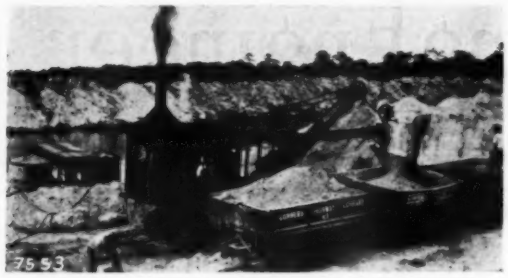
Close-up of Bucyrus 20-B driving piles for Conners' Florida Highway, showing construction of leads used with No. 3 Union Iron Works hammer. Note the reinforcing planks over which the machine moves.

This bridge will connect the west coast state highway system to the Conners' Florida Highway, which was described in detail in *The Excavating Engineer* of February, 1924.

The Conners' Florida Highway organization used two Bucyrus 20-B ¾-yard shovels on their highway work. These machines were equipped for use as either draglines or shovels. For building this long bridge, and for constructing bulkheads on exposed portions of the highway, pile drivers were necessary. The Conners' organization placed the 20-B dragline booms on the machines, after adding a channel iron extension of their own design and manufacture to carry a sheave for the pile line. There was no other change to standard equipment beyond placing a larger and longer pin at the end of the boom to carry the leads, which were designed and made on the job. A No. 95 Union Pile Hammer, size 3, of 4250 pounds weight, made by the Union Iron Works, was used; the leads weighed approximately 1500 pounds, and to counterbalance some of this load a log counterweight of 1800 pounds was fastened to the back of the machine.

The machines were equipped to burn oil under their boilers, and had moved approximately 200,000 cubic yards of rock and 100,000 cubic yards of other material in the building of the highway.

The machines operated on a 26-foot radius and were found to be extremely rapid in the handling of the work. To quote Mr. D. H. James, superintendent of construction: "That these machines were first-class shovels and draglines was a surprise to no one, but they were a surprise and a constant source of interest to every construction man who saw them equipped as pile drivers. The pictures will give you a good idea as to how we had them rigged, but nothing short of seeing them handling and setting a pile would show up their full efficiency. Our repairs while using the machines equipped as pile drivers have been nil, this after moving practically 300,000 cubic yards of material in about fifteen months."



One of the Bucyrus 20-B machines equipped as shovels, at work loading 200,000 cubic yards of rock for Conners' Florida Highway, Incorporated. It loaded 264 4-cubic-yard cars in one 12-hour shift.

Thirteen hundred creosoted piles, varying from 30 to 50 feet long, were driven by the small machines, one machine working across from the west, driving piling for the approach as it moved. The other machine worked on the eastern end, part of the time upon a barge. The lighter was held in place by lines and hand winches, the machine moving back and forth and swinging to set the piles. The work was exceptionally well aligned. A total of 800,000 board feet of creosoted lumber were used in the construction of the bridge; the work was started in August and turned over to traffic on December 2nd. The construction organization believe this to be a record, and give a great deal of the credit for the fast work to the mobility and efficiency of the two small revolving shovels.

We are indebted to D. H. James, superintendent of the Conners' Florida Highway, Incorporated, for the subject matter of this article.

Deep Pit Gravel Excavation with a Clamshell Excavator

Description of Plant of Montezuma Road and Concrete Gravel Co., at Montezuma, Indiana

DOWN on the Wabash River about 150 miles south of Chicago, near the western border of Indiana, lies the little town of Montezuma. Here the Montezuma Road and Concrete Gravel Company was organized in 1916. This company controls at present about 160 acres of gravel deposits along the Chicago, Indiana & Western Railroad.

Development

The growth of this company is interesting, as it illustrates what a modest beginning coupled with good business judgment will do in the development of an extensive and steady business.

For the first year or more all gravel removed from this pit was shoveled by hand and loaded into mule carts, which were hauled to the railroad siding.

Then came the advent of machinery, and for the next two years a small gasoline loader replaced the hand shovel.

At the end of the third year this company had gradually increased its equipment until it

Loading Twenty-five Carloads of Gravel per Day from a 35-foot Pit, with Only Five Men on the Job.

included a Byers crane, a Davenport locomotive and eight 2-yard cars.

But the business was growing, the demand for road gravel was greater than their equipment would handle. The best that could be done was ten carloads a day, but this was not sufficient to keep ahead of orders.

At this point a Bucyrus 20-B clamshell machine, mounted on caterpillars, was purchased. This machine, which is equipped with a 35-foot boom and ¾-yard bucket, stands on the surface, digging to a depth of 35 feet and loading anywhere from 18 to 25 gondolas per day, with a capacity of about 30 cubic yards each, or from 550 to 800 cubic yards in that period. For the present at least, this method of loading directly into railroad cars has eliminated the use of dump cars and locomotive.

The Gravel Deposit

The gravel deposit extends to a depth of 50 feet or more below the surface.

The first two feet of surface is soil, which is stripped with scraper and hauled 1,000 feet away.

When the gravel has been removed to a depth of 35 feet below the surface over a sufficiently large area, the clamshell machine will be lowered to the 35-foot level, and, of course, tracks will also be laid in the pit at this level.

The reason for determining on the 35-foot level is that it is just above the water line. Therefore, the remaining depth of 15 feet or more must be dug under water.

It is probable that the machine will be equipped with a dragline boom and bucket for handling the deposit from this point down.

Cars are loaded through a screen designed by the Montezuma Road and Concrete Gravel Company. This screen is constructed of steel rails, so arranged that large stones are deflected from the car.

Organization

At present a crew of 5 men, who handle as many as 25 carloads of gravel per day, are employed in the pit — namely, the machine operator, the fireman, two men at the screen and one man caving the bank.

One very good reason back of the smooth-running organization is the fact that those who supervise the business are very much on the job. Carl Farner, the general manager, is at the levers of the 20-B, and Cliff Farner, his brother, is superintendent.

The Combination

Dr. Charles Mayo says that the average man contains fat enough to make seven bars of soap; iron enough to make an eight-penny nail; a pinch of magnesium; potassium enough to explode one toy cap pistol; enough sulphur to chase the flies off one dog; lime enough to whitewash a medium-sized chicken coop, and phosphorus enough to tip 2,500 matches, all of which may be obtained at a drug store for about 98 cents.

Montezuma Road and Concrete Gravel Company's Bucyrus 20-B clamshell loading gravel from 35-foot pit directly into car on Chicago, Indiana & Western Railroad siding. Note that material is screened as it enters the car.

Gasoline Shovel Operation in Omaha

F. L. Busche, Contractor, Is Using a ¾-yard Gasoline Shovel for General Contract Work, Including the Tearing Up of Concrete and Asphalt Pavement, Deep Basement Excavation, Etc.

TO those who live in the vicinity of Omaha, Nebraska, F. L. Busche requires no introduction. This gentleman has been building up for himself a reputation as an earth-moving contractor that will serve him well as years go by.

This article concerns itself with his activities during the past year on a variety of work in his city, in connection with which his Bucyrus 20-B ¾-yard gasoline shovel plays a leading role.

Motor Trucks Used for Haulage

Mr. Busche's outfit consists in the main of the above-mentioned shovel, which he acquired early last year, and a fleet of Pierce-Arrow motor trucks. With this equipment he has figured in most of the important jobs that have been done in that city during the past year.

F. L. Busche of Omaha

The greater part of his contracts have been for street work, on which he has handled upwards of 60,000 cubic yards. This work required cuts running from 21 to 24 feet in width, with a depth ranging from 18 inches to two feet.

Shovel Ripped Up 12-inch Concrete

Perhaps the most interesting job among the many, at least from the standpoint of the attention it attracted, if not for the performance itself, was on Capitol Avenue, one of the city's most important thoroughfares. Here the task placed before him was the ripping up of

Bucyrus 20-B ¾-yard high-lift gasoline shovel tearing up and loading a 12-inch asphalt pavement and concrete base on Capitol Avenue, Omaha, Nebraska. About 300 yards a day were moved.

old asphalt pavement and 12 inches of concrete base. Here the shovel kept 5-ton Pierce-Arrow trucks and a fleet of 1½-yard wagons on the jump to take off the 12,000 cubic yards involved.

3000 yards of 12-inch concrete was torn up by this machine at an average of 300 yards per shift.

Mr. Busche tells us that the average output he has obtained from the shovel on average street work has been 400 cubic yards per day, with a consumption of 30 gallons of gasoline in 10 hours, costing him about 11 cents per gallon.

The best run recorded to date is 225 five-ton truck loads in 10 hours, each truck averaging about 4½ yards. He adds that in making the run the shovel was obliged to wait for trucks a good part of the time. This, as will be seen, figures out to somewhat over 100 cubic yards per hour.

Excavation of 6,000 yards for the basement of a Knights of Columbus Clubhouse in Omaha. Note the extremely compact, hard nature of the material.

This excavation ran to a depth of 27 feet through very compact material, the top two feet of which were frozen.

A Large Foundation Job

His work, however, has not been entirely street excavation. He recently completed the excavation of 6000 cubic yards for the new Knights of Columbus Clubhouse. On this job the cut ran to a depth of 27 feet in stiff material, capped with 24 inches of frost. Ten 5-ton trucks were used on this contract with a 5-mile haul.

F. L. Busche's Gasoline Shovel Loading One of the 16 Pierce-Arrow 5-ton Trucks Used by That Contractor

An Unusual Accident

As might be realized, these 60,000 yards were not all moved without a hitch. But the hitch we have in mind proved to be an interesting one. While grading a street one day in North Omaha, the shovel broke through an old culvert, and slipped into a sewer. The pose that the shovel found itself in is illustrated herewith. However, under the able guidance of B. L. Cullen, the shovel engineer, she climbed out of the hole under her own power after several hours of strenuous work, none the worse for her experience.

Bucyrus 20-B shovel after it had broken through an old culvert. The left-hand caterpillar is entirely below the surface, but the machine crawled out under its own power, and apparently was none the worse for the experience.

We are indebted to the courtesy of Mr. Busche for the information contained herein.

Digging a Power Plant Channel in Maine

An Unusual Excavation of the Tail-Race of a Central Maine Power Company's Plant Carried On During Operation

IN Kennebec County, "down in Maine," is a stream called the Messalonskee, draining an area of about 200 square miles. On this stream are a number of beautiful lakes and ponds which make possible a storage capacity of 4,000,000,000 cubic feet. The last of these lakes takes the name of its feeder, Messalonskee. In the ten miles from this lake to the point where the stream empties into the Kennebec River, there is a total drop of 200 feet. Here the Central Maine Power Company has built four hydro-electric plants.

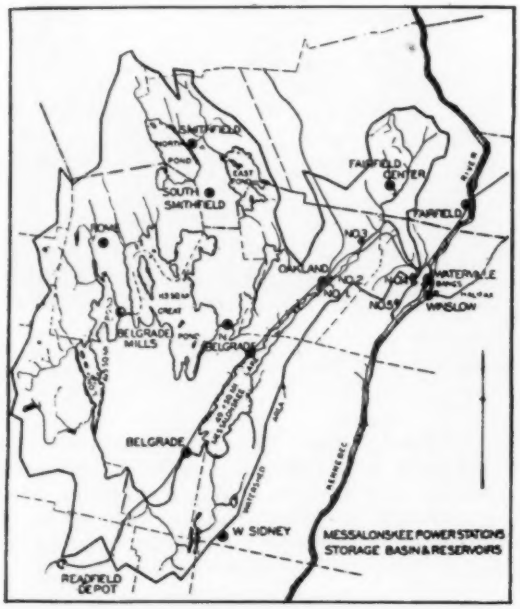
Rarely is there to be found such complete control of watershed, stream and power stations as in this watershed area. Beginning with the drainage area which includes all of the ponds in the Belgrade Lake system with their watershed, this company has almost human control of all of the waters here available for hydro-electric purposes. Instead of this water flowing idly to the sea as it once did, the Central Maine Power Company now uses it at four different stations, one after the other, as it runs down the Messalonskee, to generate approximately 10,000 horsepower. A fifth power house will soon be built, Messalonskee No. 1, which will utilize a 25-foot drop, not at present developed, and add another 1000 horsepower to the energy supplied by this stream.

The Messalonskee Gorge, showing the character of the rock excavated. This rock was removed to a depth of from 4 to 8 feet for a distance of 1000 feet.

Some time ago it was found that by excavating the tailrace of Messalonskee No. 2, then developing 3733 h.p., 7 feet of additional head, and consequently more power, could be obtained.

10,000 Yards of Slate Rock Excavation

The work involved lowering the river bed from four to eight feet for a distance of 1,000 feet; the excavation amounted to about 10,000 cubic yards of slate rock to be cut from the narrow gorge worn by the erosion of the stream.



Map Showing Watershed Area and Plant Locations on the Messalonskee Stream Development

Narrow Gauge Track Through the Messalonskee Gorge, for Disposing of the Excavated Material Some 2000 Feet Downstream

The contract was let to the Sanders Engineering Company of Portland, Maine, who turned the trick with a Bucyrus 20-B ¾-yard steam-driven shovel, mounted on caterpillars. The most inter-

esting part of the new development was the difficult circumstances under which the work had to be carried on.

The Problem Envolved

While power was being developed by the station, water rushed through the narrow channel to a height of over ten feet. Therefore, the work had to be carried on when the station was idle, and the water held by the sluice gates in the storage pond above. It was impossible to shut down the plant during the day, because the peak load for the plant, which supplied power for manufacturing plants and paper mills in the vicinity, occurred during the day, and so all the work had to be done at night.

Ordinarily, night operation would only have meant moving the shovel into the gorge in the evening, and out again in the morning, early enough to leave time for filling the storage ponds of the three downstream stations. But uncontrollable water conditions upstream made it necessary to drain the pond once during the night. Accordingly, the little steam shovel could find only about six or seven hours a night in which to actually dig. The following schedule had to be adopted.

The gorge of the Messalonskee drained to allow operation of the steam shovel on the river bottom. In ten miles length, this stream is made to develop 10,000 h. p.

The Bucyrus 20-B steam shovel handling rock in a narrow gorge, where it worked in from 12 to 24 inches of water. Elmer Cochrane is at the levers.

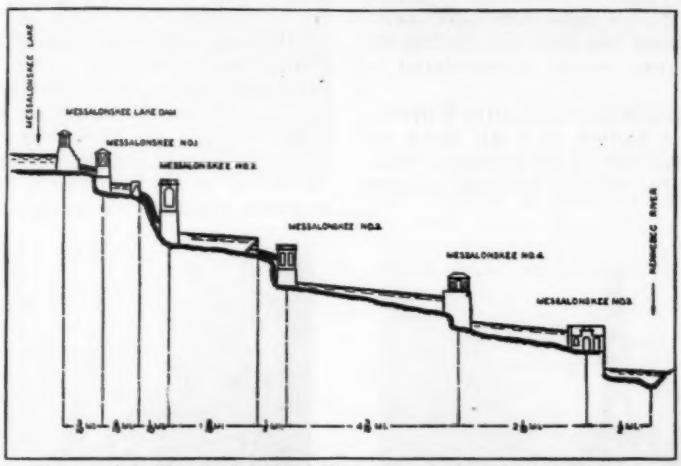


Diagram of the Messalonskee Power Plants from the Lake to Kennebec River, a Distance of Approximately 10 Miles

Water was withdrawn from the supply pond above Messalonskee No. 2 every night between five and six p. m. The caterpillar-shovel was then run into the cut where it could work until midnight. By that time the supply pond would become filled up, and the shovel had to be run out.

The pond was then drained, and the shovel again entered the gorge and could work until 5 a. m.

The shovel was working continually in a foot or two of water, and had to be moved in and out of the cut each time the upper supply pond overflowed or was drained. The manner in which this machine met these requirements presents an excellent testimonial for anyone doubting the value of caterpillar mounting for a machine of this size.

During the day, when the power plants are in service, this gorge is filled with water running approximately 10 feet deep

(Continued on Page 177)

Highway and Storm Sewer Work in New Jersey

Description of William A. Ferguson & Son's Company's Shovel Work on the Caldwell Mountain Road and Clamshell Operation on a Storm Sewer Contract in Paterson

ABOUT the middle of last October the Essex County Highway Commission of New Jersey awarded the contract for building a new 30-foot road up the west Caldwell Mountain to Wm. A. Ferguson and Sons, Inc., Little Falls, New Jersey. West Caldwell Mountain lies near the northern boundary of Essex County, not far from the Passaic River.

This road is the last connecting link on the short cut highway between Singac and Verona, and involves excavation of 20,000 cubic yards of a gravel clay, with conglomerate, cemented so as to form a material almost as hard as concrete.

Machine Worked Continually on 12% Grade

However, despite the fact that the material was hard, and that the shovel worked up a 12% grade all the time, it averaged 450 cubic yards per day, and completed the contract during the first week of December, which is considered an excellent record.

Excavated material was loaded into 6 five-ton Packard trucks, and hauled to a fill down the mountain at the lower end of the contract, where the Jersey City Water Supply concrete conduit crosses the highway.

Eventually this will be a concrete road, but, as yet, the contract has not been let for the surfacing.

George Ferguson has good reason to be proud of his record on this work. He advises, incidentally, that his shovel handled this hard material with no lost time for repairs.

Clamshell Used on Storm Sewer Job

Mr. Ferguson has recently completed another contract in Paterson which is worthy of mention. This was a $300,000 contract for building a storm sewer in Totowa Borough. He purchased for this work another Bucyrus 20-B. This machine was furnished with an extra 35-foot boom and clamshell bucket.

Machine Also Works as Crane

With this clamshell equipment he dug a trench 6 feet wide and 15 feet deep in clay, hard pan, sand and gravel. The machine also did the pipe laying and backfilling. This was done from the same setting. In other words, after excavating a stretch he would drop his clamshell bucket, and operating as a crane lower the sections of pipe in place, and then replace his bucket and backfill.

Bucyrus 20-B, with 35-foot boom, used as crane for placing sewer pipe. Note the clamshell bucket at the left.

The Same Machine Working as a Clamshell Excavator on the Storm Sewer

In this manner he completed his storm sewer contract at the rate of 40 feet per day.

The 20-B on the Caldwell Mountain road contract was operated by Thomas Baldwin, and fired

Wm. A. Ferguson's Machine Equipped as Shovel, Working on Caldwell Mountain Road

Bucyrus 20-B, Thomas Baldwin, Engineer; Richard Speigh, Fireman

by Richard Speigh, while the machine on the storm sewer was operated by Thomas Ferguson.

The officers of the company are: Mrs. Wm. A. Ferguson, president; George and Thomas Ferguson, vice-presidents; Irving B. Hooper, treasurer, estimator and publicity manager. George Ferguson is also general superintendent.

Fording a 200-Foot Stream with a Small Revolving Shovel

While preparing the way for the Tallassee Power Company's railroad, which involves the construction of a railroad bridge over the Cheoah River at Topoca, North Carolina, it was necessary to transfer a Bucyrus 18-B caterpillar-mounted steam shovel from one side of the river to the other.

Since there was no bridge across the river of sufficient strength to carry the load, the only hope was to ford the river. Nearly every one who looked at the rock-infested stream, some 200 feet in width, declared it impossible. However, I. G. Calderwood, of the Tallassee Power Company, who is in charge of the work, sent her on the way, sink or swim.

Two hours later, the little shovel had completed the crossing. It was necessary to move with the dipper many obstructing rocks, and in some places the water was higher than the frame. Having reached the opposite shore, the machine

Bucyrus 18-B air-driven shovel on caterpillars, crossing the Cheoah River at Tapoca, North Carolina, on a rock-infested bed, where it was necessary to remove large stones and clear the way while the frame was almost entirely submerged.

cleared a pathway for itself up the rocky bank of the river for more than a thousand feet, to a point where it is now working on ground underlaid with ledge, every foot of which must be drilled and shot.

This shovel is operated on compressed air furnished through a four-inch pipe line, one and one-half miles long. Due to limited compressor capacity at the present time, and the need for a great deal of drilling, the shovel will be put back on steam, and fired with wood until the railroad bridge is completed. It will then again be possible to get their railroad up behind the shovel with a new air compressor plant, and the shovel will be put back on air, which, under the circumstances, has proved a very satisfactory means of furnishing power.

We are indebted to Mr. I. G. Calderwood, for the above.

Digging a Power Plant Channel in Maine

(Continued from Page 175)

The material removed from the excavation was loaded into two-yard cars, running on the bed through the gorge and over trestles to the dump 2,000 feet downstream. A Plymouth gasoline locomotive was used to haul material to the dump.

In spite of the unusual difficulties under which the excavation had to be accomplished, The Sanders Engineering Company completed the job in good time, and the Central Maine Power Company added another improvement to the efficiency of this highly-developed stream.

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Signs of the Times

As we find ourselves well toward the middle of the year 1925 the signs of prosperity for this and the years of the immediate future multiply in numbers. Indications are that there will be great activity in railroad work, highway building and power development.

Railway expenditures for additions and betterment in United States and Canada will probably total between $1,250,000,000 and $1,500,000,000 in 1925. Of this total it is estimated that from $750,000,000 to $1,000,000,000 is assignable to roadway and structures.

From the state of Tennessee comes the estimate that the highway department of that state will spend over $10,000,000 for road work during the year of 1925.

In California we learn that the Pacific Gas and Electric Company of San Francisco will expend in the neighborhood of $15,000,000 on a new hydro-electric project to be known as Pit River No. 4. This work will involve the construction of a diversion dam and a four-mile tunnel that can be driven from only two headings. This plant will develop about 135,000 h. p.

From Georgia we learn that Savannah is planning extensive additions and improvements to its port facilities at a cost of something in the neighborhood of three million dollars.

At Fort Lauderdale, Florida, we understand that a tract of land including islands and waterfront property has been purchased by W. F. Morang & Sons of Miami, who are planning a development which will involve the expenditure of $10,000,000. This development will be known as Lauderdale Harbors, and will include a deep channel 600 feet wide to accommodate large yachts.

In Missouri preliminary surveys have been made for a hydro-electric development on the Black River near Leeper by the Black River Power and Development Company. The plans of this company involve construction of a dam for the joint purpose of generating electric current and protecting farm lands nearby from the flood water of the river. Development is expected to cost about $3,500,000.

These are, to be sure, only a few of the host of such items which we see at every turn. It seems to behoove the contractor and excavating engineer to prepare himself for the business that is promised by these indications.

Winter Construction Movement Gains Momentum

The movement which now appears to be well under way for correcting seasonal ups and downs of construction work undoubtedly has the interest and most assuredly should have the vigorous support of earth-moving contractors. This move for year-around building is being given the solid backing of construction centers throughout the country, according to a recent report to Mr. Hoover by Dr. John M. Gries, Chief of the Department of Commerce, Housing Division. Chambers of commerce, builders' exchanges, lumber dealers, master builders and contractors' associations in such cities as Cleveland, Wilmington, Omaha, St. Louis, New York, Philadelphia, Chicago, Akron and Los Angeles, are taking vigorous steps not only to push this movement but to make scientific studies of the conditions of winter work, to the end that a logical move may be made.

It is interesting to note that the total valuation of contracts awarded in the City of Chicago for the month of December is well above the same month of the previous year, and this same condition is beginning to appear in other cities of the country.

Associations in various cities are making studies in order to obtain from weather records the facts as to the average and extreme weather conditions, so that builders may have a basis on which to figure probable delays due to winter construction.

We will watch this movement with interest.

Do You Know This Address?

We have been requested to obtain the address of Terry E. Smith for an aged father and sister who are very anxious to locate him. Please send any information concerning this individual to *The Excavating Engineer*. We will be glad to forward it to his relatives.

DEVICES YOU OUGHT TO KNOW ABOUT

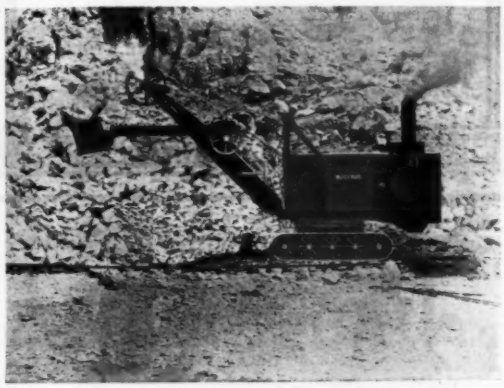
A New Quarry and Mining Shovel

The Bucyrus Company has just announced a new shovel that is fundamentally different from anything yet placed on the market.

Realizing the fact that the first cost of a shovel is of minor importance as compared with a low maintenance cost, especially for severe service, such as in quarries, mines and for other work where extremely hard digging conditions are encountered, Bucyrus engineers have developed a 4-yard, full-revolving shovel, which combines the rugged strength, power and speed of a railroad-type shovel with the greater mobility and the full-circle swing of a revolving shovel.

This machine is known as the 120-B. It is caterpillar mounted and may be operated by steam or by electricity.

The introduction of this machine is regarded as a landmark in the design of heavy excavating machinery.



New Bucyrus 120-B 4-Yard Quarry and Mining Shovel — Steam-Driven

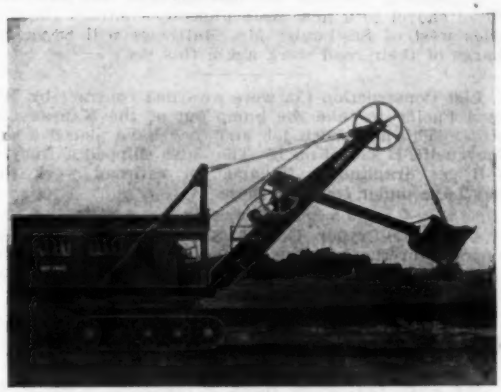
It is built with a close-coupled strength, sturdiness and digging power heretofore found only in the railroad-type shovel. For example, the boom is about the same length as that on a 115-ton railroad-type shovel, and at the same time its shafts are designed with from 30 to 50 per cent greater strength than heretofore used in conservative design.

The base and the revolving frame are of solid casting construction without structural work, rivets or bolts. These units incorporate even greater solidity of design than the heavy front end construction of a railroad-type shovel.

It contains refinement of design such as Superheater equipment, fire brick arch in the boiler, and brass shell bearings, never before offered as standard with any shovel.

The grate area of the boiler is 10 per cent more, and the heating surface 15 per cent greater than the most powerful railroad-type shovel. With Superheater equipment the boiler efficiency is further increased by the reduction of water and coal consumption by from 20 to 30 per cent.

It is the largest shovel that has yet been mounted on caterpillars.



Bucyrus 120-B Electric Shovel with 4-Yard Dipper and 29-Foot Boom

This shovel has been brought out by the Bucyrus Company in order to meet the growing demand for a quick-acting, full-revolving shovel of large dipper capacity, with greater strength, greater power and greater mobility than has heretofore been produced, and at the same time with clearances which will enable it to operate in confined spaces and narrow cuts.

It is not intended for work where very wide digging and dumping reaches are required. This company offers a complete line of stripping shovels for this purpose.

This shovel will literally revolutionize steam shovel equipment for any work requiring extremely heavy digging. A full description of this machine may be obtained from the new bulletin just issued by the Bucyrus Company.

Schramm, Inc., West Chester, Pennsylvania, manufacturers of portable air compressors, announce a new type of compressor built in two sizes with piston displacements of 120 and 165 cubic feet per minute. These machines use an air-cooled, 4-cylinder, vertical L-head, heavy-duty gasoline motor, direct connected to a two-cylinder vertical compressor, both engine and compressor mounted on heavy steel channel frame with air tank, gasoline tank, etc., carried on either broad-faced steel or rubber-tired wheels. All equipment completely inclosed. Clutch is provided between the compressor and engine, so that the engine may be started and brought up to speed before the compressor load is thrown on. We understand that the price of these compressors is no higher than those having about 25 per cent less piston displacement.

SHOTS FROM THE · FIRING LINE ·

Iowa and Missouri

BY W. G. PARROTTE

Bill Hayes of Detroit is ready to start on a new city water main in St. Louis.

J. A. Schaefer Construction Co. have finished the Bell Telephone Building basement in St. Louis.

Tibbetts & Tibbetts are moving their Bucyrus 30-B Diesel shovel to a new state highway contract about 25 miles west of St. Louis. Mr. Matthews will be in full charge of their road work again this year.

List Construction Co. were awarded contract by Missouri Pacific to take the hump out of the Kansas City yards. This is a rush job and they have placed a new Bucyrus 50-B shovel on it. They also shipped a Bucyrus 30-B gas dragline to Panama for railroad work that they have under contract there.

Carmuhiel-Cryder Co. of St. Louis were awarded contract for the building of new yards in Kansas City by the Wabash Railway. They will use a Bucyrus 50-B on this work.

Wm. Hawks writes that he is working on a Bucyrus 70-C at La Port City, Iowa.

We learn that Jesse Black is operating a shovel for the Greenville Gravel Company at Brighton, Michigan.

We hear that Mr. A. B. Baumgartner is at the present time superintendent of the North Western Gravel Company's quarry at Le Grand, Iowa. He tells us that it is one of the best commercial rock quarries in the state.

New York and Vicinity

BY T. A. BURNS

Wilson & English of New York were the successful bidders on the Central Railroad of New Jersey work at South Amboy, New Jersey. This work includes about 9,000 feet of track depression.

The Rosoff Subway Construction Company have their section of the St. Nicholas Avenue subway well under way. In addition to the shovel equipment now in use on the surface they have on order two Bucyrus tunnel shovels. These are 3-motor A. C. electrics. The Bucyrus shovels on the surface work are 20-B high-lift, caterpillar-mounted steam machines.

Heyman & Goodman, who also have on order four Bucyrus electric tunnel shovels, are well under way with their section of the St. Nicholas Avenue subway. This firm ordered these tunnel shovels so that they may be converted to standard machines on the completion of the tunnel work. These are two-motor D. C. electrics.

Ray De Grane is back with P. S. Kramer of Paterson, N. J., operating a 20-B Bucyrus high-lift shovel on the Macopin and West Milford job. Until recently De Grane was operating a Bucyrus 20-B air shovel on the Patrick McGovern section of the new Philadelphia subway.

The Coogan Subway Construction Company are now ready to start on their section of the Central Park West subway.

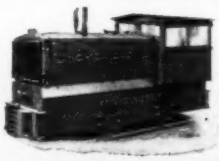
Railroad work in this vicinity is bound to absorb most of the large equipment now lying idle in the East.

With the activity in subway construction here, in Philadelphia and Rochester, as well as developments on new railroad construction in the East, cellar excavation, road grading, sewer, drainage and reservoir work must not be lost sight of, as in fact there has never been a time within our memory when there was more activity in these lines in the neighborhood of New York.

Ohio Notes

W. O. Kennedy, with the Walsh Construction Co., is heading in on 250,000 cubic yards cutting down grades and strengthening the main line on the Hocking Valley Railway near Alvada, Ohio.

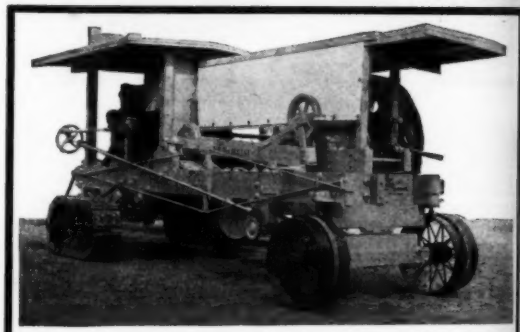
MILWAUKEE
Gasoline Locomotives



BUILT in sizes from 4 to 15 tons. For all Gauges of Track.

Write for Catalogs P-129 and P-136.

MILWAUKEE LOCOMOTIVE MFG. CO. MILWAUKEE WISCONSIN



The "CLIPPER" Blast Hole Drill
New Model
There is a reason why the "CLIPPER" predominates in the blast hole field.

No Cogs in Front End Mechanism

This machine is simple, durable, and easily maintained. It is made for steam, electric, gasoline or air drive. (Also made in Round Wheel.)

Write for Catalog

The Loomis Machine Company
(Established 1842)
K Street, Tiffin, Ohio

A MONOPOLY OF QUALITY IS RARE

In this day of keen competition, manufacturers are perhaps in some measure excusable for frequently overstating the virtues of their wares. Indeed, it is difficult not to do so. But overstatement on the part of the manufacturer often leads to the customer's disappointment.

Few manufacturers have a monopoly on the quality of what they make. We are not an exception. However, we have developed a series of excellent explosives, among which one can be found that will meet your blasting requirements effectively and economically. We know of no better explosives for your work than are included on our list.

Naturally, you know your own business best; but if our experience in helping many others with their blasting difficulties should seem of possible value to you, feel free to call upon us at any time.

The following publications will be sent free, upon request: Scientific Quarry Blasting, Hercoblasting, Modern Road Building, Safety in the Use of Explosives, Eliminating Waste in Blasting, Shot Firing by Electricity, Hercules Galvanometers & Rheostats, Dynamite: the new Aladdin's Lamp, Conquering the Earth. Address, Hercules Powder Co., 990 King St., Wilmington, Del.

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WILKES-BARRE, PA.
WILMINGTON, DEL.

HERCULES POWDER CO.

UMI

Pacific Coast News

BY P. H. BIRCKHEAD AND J. H. SACKETT

Contract awarded to San Francisco Bridge Co., Nevada Bank Building, San Francisco, who bid $.2080 per cubic yard, total bid 201,150 cubic yards, in channels and placing fill back of seawall.

Contract awarded to the Channel Construction Co., 1030 Bank of Italy Building, Los Angeles, who bid $44,203 for the improvement of First Street from Harbor Boulevard to Pacific Avenue work for City of Los Angeles, consisting of grading, paving with concrete and asphalt concrete, constructing curb, walk, gutters, storm drains, sanitary sewer, house sewers, iron pipe, conduit, etc.

Contract awarded by Southern Pacific Co., 65 Market Street, San Francisco, to Utah Construction Co., Phelan Building, San Francisco, for 32 miles team work from Hassayampa west.

Contracts awarded as follows by California Highway Commission, 515 Forum Building, Sacramento, for highway projects: Merced County, 6.4 miles of concrete paving and widening from Merced River to Cuhac, awarded to: H. H. Peterson, Spreckels Building, San Diego, who bid $139,367, engineer's estimate $157,927, bids and quantities issue of March 10th; Yolo County, 12.8 miles concrete shoulders from Woodland to Woodland Y and from Davis to Putah Creek, awarded to Kaiser Paving Co., American Bank Building, Oakland, $135,904, engineer's estimate $141,232.

W. J. Fetterly and Mat Henrahan have gone to Mexico for the Hauser Construction Company to run a Bucyrus 30-B machine for the Hauser people.

Robert Coleman and Ralph Welker are working for M. S. Ross in San Fernando on a Thew mucker. Russell Ninard and David Dietz are working on the 20-B Bucyrus for M. S. Ross at San Pedro.

Eastern Pennsylvania Notes

BY T. H. BARRETT

The Lehigh Valley Coal Company have recently awarded to the Rhodes Construction Co., Ashland, Pennsylvania, a two-million-yard stripping contract at Ashland.

A. E. Dick of Hazleton, Pennsylvania, has recently been awarded a very extensive stripping contract by the Lehigh and Wilkes-Barre Coal Company. This work includes the stripping of the mammoth vein on their property at Audenreid.

T. Stewart & Sons, of Newton, Massachusetts, who will construct the dam and reservoir for the city of Pottsville, have started up their work after a shutdown through the winter months.

Philadelphia and Vicinity

BY J. A. MURRAY

H. S. R. McCurdy, formerly division engineer Miami Conservancy District, Dayton, Ohio, and prior to that division engineer on the Catskill water supply for the City of New York, has joined the staff of Patrick McGovern, Inc., as construction engineer on the $14,000,000 contract which that firm holds for a portion of the Broad Street Subway, Philadelphia.

Harry Curtis of Philadelphia was recently awarded some betterment work on the Delaware, Lackawanna & Western.

Tested Supplies

WIRE ROPE
ROPE SOCKETS
ROPE CLIPS

HOISTING CHAIN
COLD SHUTS
PATENT LINKS

PACKING
Asbestos
Flexible Metallic
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BUCYRUS COMPANY

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Obtain better blasting results at lower costs

Du Pont chemical engineers insure uniformity of quality by chemical control through every step of manufacture from raw material to finished product.

WHEN you buy du Pont explosives you buy something more than a commercial product.

Back of every pound of du Pont explosives are the knowledge and experience gained during 122 years in the development and production of explosives.

The uniformity of its products has made the du Pont Company's explosives standard throughout the world. This uniformity is obtained through the exercise of the most careful selection of all materials and the complete chemical control of every stage of production from raw material to finished product.

Because of the quality and efficiency of du Pont explosives their users do obtain *better* blasting results at *lower* cost.

Blast with du Pont powders

There is a du Pont explosive to meet every blasting need—to do *your* particular work *best* at *least* expense. For contracting we especially recommend:

Red Cross Extra Dynamite: 20% to 60% strength; low-freezing; fairly water-resisting; heaving and lifting action.

Du Pont Gelatin Dynamite: 25% to 90% strength; water-resisting; low-freezing; dense, plastic, less obnoxious fumes.

Du Pont R. R. P. (Judson type): 5% strength and low-freezing.

Du Pont blasting powder is the most widely used low explosive. It is regarded as standard everywhere. Every keg bears the orange band.

Du Pont blasting accessories give you maximum efficiency from your explosives. Make every shot *sure*—protect your blasting investment by using only du Pont accessories.

For further information about the du Pont explosives and blasting accessories, please refer to "Road and Street Catalog"—or write to our nearest office.

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POWDER MAKERS SINCE 1802

For convenience in making inquiry use postal inserted in this number.

Mike McMineman of Philadelphia has recently been awarded two very nice contracts, one being a section of the Pennsylvania work between Canton and Bayard, Ohio, the other at Reading, Pennsylvania, for the Reading Railroad. This latter work includes freight yard extension.

The Conowingo, Maryland, work which includes a power dam over the Susquehanna River, and a 10-unit hydro-electric power plant for the Pennsylvania Light & Power Co. of Pennsylvania, and contract for which was awarded to Stone & Webster of Boston, Massachusetts, has been temporarily held up awaiting the necessary approval of the Commonwealth of Pennsylvania and Maryland. Work is expected to go forward within a short time on the contract which will cost $56,000,000.

Pittsburgh and Vicinity

BY F. B. SMITH

The contract for the Pennsylvania cut-off from Canton to Baylord, Ohio, was recently awarded. The successful bidders were A. Guthrie for Section 1; Mike McMineman for Section 2; John F. Casey for Section 3; Ferguson-Edmondson for Section 4. This contract was one of the largest projects attempted by the railroad company for some years. John F. Casey will put one of his 50-B Bucyrus shovels on this work.

Mike Netherland of Pittsburgh was awarded a contract for the Children's Hospital. He has two Bucyrus 20-B's on this work, one working as a shovel and the other as a clamshell.

Southern States Notes

BY W. W. WHORLEY

Reid & Lowe of Birmingham, Alabama, report that they have recently landed a nice piece of double-track work on the Florida East Coast Railway near Cocoa, Florida.

The Kershaw Contracting Company are making dirt fly on their section of the Florida East Coast work between Jacksonville and St. Augustine. This firm was also awarded a large amount of new work involved in the Palatka cut-off.

Mr. R. E. Hardeman is handling a Bucyrus 50-B shovel for the Central Iron & Coal Company in their brown ore mine at Giles, Alabama. Mr. John Shackleford is superintendent in charge of operations.

Ed Isreal, an old-timer on standard shovels, paid us a visit recently. Ed states that he is to be located with the Roquemore Gravel Company at Montgomery.

Alva Burris is operating a Class-175 electric dragline at Mine No. 10, Mulberry, Florida, for the International Agricultural Corporation.

St. Louis Items

BY A. B. KOENIG

E. N. Jeffrey of the Parquette Construction Co. passed through St. Louis on his way to Bluford, Illinois, where their outfit is at work on the Illinois Central cut-off. Jeffrey says they have some nice machine work to sublet there.

Tom Walsh and W. A. Durkin of the Walsh Construction Co. were here looking over the Missouri Pacific Railroad double-track work between St. Louis and Jefferson City. The Walsh Company were just awarded 40 miles of double-track work between Columbus and Toledo, Ohio, by the Hocking Valley Railroad.

Hayward Buckets

Greedy for work!

You'll think so, too, when you see a Hayward Bucket gobbling up such loads as this and "getting away with it."

They stand the stress and strain of hard drives. Their sturdy construction endures under bucket-killing loads. They can be trusted to "follow through" with economy in performance, and satisfaction to owner.

If you'll read Catalog No. 43, we'll send it on request. It's all about Hayward Buckets and the kind of work they do.

THE HAYWARD COMPANY
52-54 Church Street, New York, N. Y.

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Builders of Clam Shell, Orange Peel, Drag Scraper, and Electric Motor Buckets; Dredging, Excavating, and Coal Handling Machinery.

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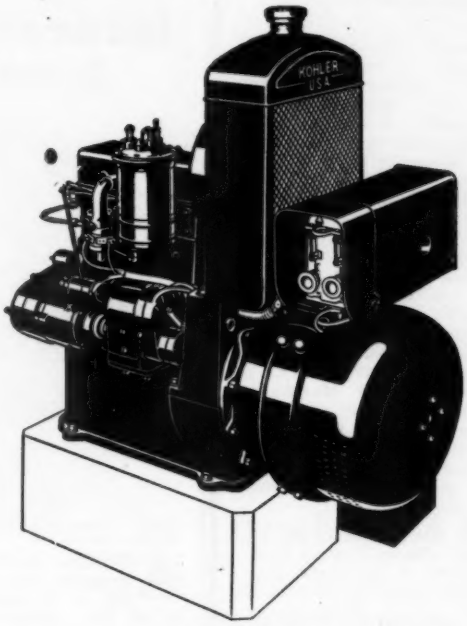

Kohler Automatic
Model "D"

Lighting the Job with Your Own Electricity

Electric lights speed up a job, save labor and time, and add greatly to the efficiency and comfort of men and animals.

Contractors in every line of outdoor work — dredging, excavating, road-building, lumbering—have found the Kohler Automatic remarkably successful for their requirements.

This plant eliminates storage battery care, expense and bulk. All it needs is a small starting battery to provide automatic start and stop. It produces current of the 110-volt kind, allowing for the use of standard lamps and appliances. Lights are bright and steady — upkeep and operating costs low. The plant is dependable and good for years of service.

Our 48-page booklet "The Principle and the Proof" tells more about this unusual plant and of the successful experiences of others in every field.

Write for this booklet.

KOHLER OF KOHLER

Founded 1873

Kohler Co. Kohler, Wis.

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Calianni & Dire Co. are constructing an addition and a hump yards for the Illinois Central Railroad. H. J. Dunn is in charge.

The Missouri Pacific Railroad are receiving bids for double tracking 30 miles of their line between St. Louis and Jefferson City, Missouri. This work will be let in four sections. E. A. Hadley, chief engineer, S. L. Wonson, assistant chief engineer and C. S. Sample, construction engineer, took a party of contractors and prospective bidders over the work in a special train leaving St. Louis on the morning of April 7th and returning the same evening. The contractors are profuse in their praise of the royal treatment and the elegant luncheon and dinner served them while on this trip by the Missouri Pacific officials and the event is one not soon to be forgotten. Among the contractors on the special were: J. J. McCaughey and Frank McCaughey; P. J. Hannan; Tom Walsh and W. A. Durkin of the Walsh Construction Co.; Wm. J. Rohan of the Winston Bros. Co.; R. E. Ross, superintendent Bates & Rogers Construction Co.; Jim Daugherty; Walter Denison: Charley Marshall; Wm. List; Keating Bros.; J. D. Lynch, Sr. and Jr.; L. J. Smith; Z. C. Mitchell, representing the Flick Construction Co.; J. C. Baxter of Guthrie & Co.; Geo. W. Gist; Mr. Hamer of Hamer Paskins Co.; Jim Finnucan; Jim Austin; J. Allhands; and several others whose names we missed.

C. C. Barnes, Xenia, Illinois, has about 75,000 or 80,000 yards of shovel work on the Illinois Central Railroad near Xenia, Illinois, to sublet to an outfit that has cars.

H. E. Lynch is moving his outfit on the Conway-Damascus Highway in Arkansas.

J. C. Baxter of Guthrie & Co. was here with us a day looking over things in this part of the country.

Big Jack McCaughey, Jim Austin, A. B. Koenig, three of the old-timers still on earth, spent several hours here rebuilding railroads that were constructed from 1880 on. This meeting brought back some very pleasant reminiscences of the past.

The Energy Construction Co. was awarded contract for graveling Missouri State Highway No. 16 north of the Butler County line about 7 miles.

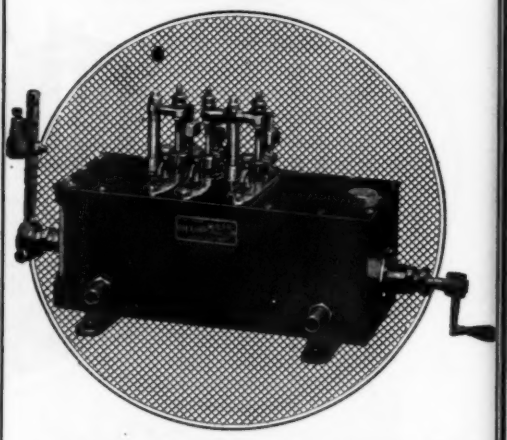
Smith Bros., Inc., Dallas, Texas, were awarded contract for the Missouri River and Turkey Creek tunnels for the new waterworks in Kansas City, Missouri.

Reid & Lowe are double-tracking 25 miles of the Florida East Coast Railway in Florida. This firm just finished a bridge across the Kallapossa River in Georgia. They have this bridge and concrete outfit idle now. They would like to place it on a similar job. Post Office Box 1990, Birmingham, Alabama, will catch them.

The many friends of A. O. Cunningham, formerly chief engineer of the Wabash Railroad, will be delighted to hear of him being elected mayor of University City, a suburb of St. Louis. Cunningham's popularity was shown by his polling twice as many votes as Oliver Abel his competitor. Congratulations Mayor Cunningham.

W. J. Rowan, representing the Winston Bros. Co., Minneapolis, was with us. He put in a bid on the new double-track work on the Missouri Pacific Railroad between St. Louis and Jefferson City. Rowan is making a good many friends in this part of the country.

Insurance Against Breakdowns



A WELL-LUBRICATED steam shovel, dragline or crane seldom breaks down. Oil at the right time and in the right place is the best possible insurance against breakdown of this important equipment.

Loss of time, the result of avoidable breakdowns, has cost and is costing the contracting industry thousands of dollars.

Dependable constant lubrication by insuring more continuous operation of your steam shovels, draglines and cranes will prevent much of this loss.

A McCord Force Feed Lubricator supplies this dependable lubrication. A McCord lubricator starts the moment a wheel turns, and forces fresh, live oil as long as the machine continues to operate.

The result is fewer shutdowns and more continuous operation.

A new and interesting catalog illustrating McCord lubricators in use by the contracting industry is ready. Address one of the enclosed post cards to McCord. Mark it send catalog.

McCord Radiator & Mfg. Co.
Detroit, Michigan

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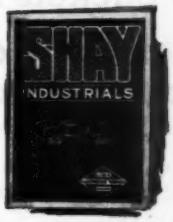
force feed
Lubricators
Standard of the Oil fields

"Our Shay Has Been in Constant Operation"



The Shay Industrial Catalog will tell you what Shays are doing under conditions similar to yours. Write for a copy.

ALL the hauling for a western company is handled by a 20-ton Shay Geared Locomotive. Conditions compel operation on two to seven per cent grades, while the sharpest curve has a radius of 146 feet.

"Our Shay has never caused delay on account of breakdown, although the locomotive has been subject to very heavy and continuous duty," is the statement of the Assistant Manager of the Company.

"It has been in constant operation for two years, and in that time the railroad has more than repaid the entire investment."

Built into every Shay is the ruggedness needed for stone haulage — ruggedness for continuous, heavy-duty service.

If you'll send us an outline of your conditions, we'll be glad to offer our suggestions for the improvement of your hauling, with sturdy, efficient Shays.

LIMA

LIMA LOCOMOTIVE WORKS

Incorporated

Lima, Ohio — 17 East 42nd St., New York

Shay Geared **LOCOMOTIVES**

Pete Shugart was seen around the stock yards in East St. Louis the other day. He bought a carload of big mules that he shipped on to his Illinois Central work.

C. C. Stoner took a run in from Mendota, Illinois, hunting a job for his team outfit which he says has been laying up there for some time.

In recognition of his services during the World War, Col. Frank G. Jonah, chief engineer of light railways in France, has been awarded the Polish decoration, "Miecze Hallerowske," The Ordér of the Swords of Haller. The award was made on the occasion of the recent visit of Gen. Haller to America. The decoration includes a diploma and a military medal bearing a white eagle and crossed swords, the national emblem of Poland. The diploma explains that the decoration was awarded for Col. Jonah's faithful service in France and Poland in 1918, 1919 and 1920. Col. Jonah went to France with the Twelfth Engineers, but was later transferred to the general staff, when he was placed in charge of light railways in France.

Charley Marshall is shipping a shovel outfit from Kentucky to Kansas. Subbed a piece of the Flick Construction Company's work on the Rock Island Railroad.

A. W. Lane, 5479 Claxton Avenue, St. Louis, has a 15-team outfit idle that he would like to place on a grading job in this part of the country.

The Biggs Construction Co., Akron, Ohio, were awarded contract for East Bottoms flow line by the Kansas City Waterworks.

A. E. Howard, 430 South Chicago Street, Lincoln, Illinois, has a small culvert and bridge outfit idle that he would like to place on work in this part of the country.

M. L. Windham has moved his shovel outfit from Church Station, Illinois, to Benton, Illinois, where he is at work on Section 3 of the new Illinois Central cut-off.

Leal Lamoreaux has a machine outfit idle at Glasford, Illinois, and wants a job for it.

Dees Bros. were here looking for work for a couple of grading outfits that they have idle at Oblong, Illinois.

Jim Daugherty of Morris & Daugherty was here looking over the new Missouri Pacific double-track work between St. Louis and Jefferson City.

Flick Construction Co. sublet their Rock Island work in Kansas, 5 miles of it to Barker Bros., 3 miles to C. N. Canover, 2 miles to W. H. Liggett, 2 miles to F. C. Lovelace. They still have about 140,000 yards of team and steam shovel work to let. Write C. Z. Mitchell, care of Flick Construction Co., 133 West Washington Street, Chicago.

R. G. Flaugher & Co., 1105 South Race Street, Urbana, Illinois, has 24,000 yards of grading to sublet on highway.

John Kenney reports two shovels and two machine outfits, also a car outfit and 40 teams, idle at Astoria, Illinois.

Canada

Montreal and Vicinity

BY J. M. WARD

The Singer Manufacturing Company are going to construct a thirty-mile railway line around Thurso, Quebec, to handle lumber from their hardwood properties.

The "Heavy Dredging" Bucket, like every other WILLIAMS, is good for years of dependable service. All parts are guaranteed against breakage, as long as the bucket is used on the classes of work for which we recommend it.

"P. S. You don't keep buckets 12 years unless they do satisfactory work"—

Dunbar & Sullivan Dredging Co.

You want the kind of service that contractors are getting from WILLIAMS Buckets—a bigger daily output year after year.

For instance, there's that 13-year-old "Honor Roll Veteran" WILLIAMS owned by Dunbar & Sullivan Dredging Co., Buffalo. Harris T. Dunbar writes: "If ever a bucket made good our WILLIAMS has. We tackle anything but solid rock with it.—P. S. You don't keep buckets twelve years unless they do satisfactory work."

Drop us a line for photos and complete details of a WILLIAMS Bucket *guaranteed to give the output you need, and to stand up.* What digging or handling work have you to do?

G. H. WILLIAMS COMPANY, 603 Hayburger Lane, Erie, Pa.
Eastern Sales Office: 30 Church Street, New York City

WILLIAMS
FAST-DIGGING BUCKETS
All Parts Guaranteed Against Breakage

This Trade Mark

THE PYLE-NATIONAL COMPANY CHICAGO

TRADE MARK REGISTERED

Stands for the Best in Steam Turbo-Generators and Floodlights.

Equip Your Night Operations with

PYLE-O-LYTES

Uuquestionably Superior in Every Respect to the Old Type Floodlights.

The Pyle-National Company

General Offices and Works:

1334-1358 North Kostner Avenue, Chicago, Illinois, U. S. A.

Canadian Agents: The Holden Co., Ltd., Montreal, Winnipeg, Vancouver, Toronto

Export Department: International Railway Supply Co., 30 Church St., New York

Write for Catalog No. 4.

For convenience in making inquiry use postal inserted in this number.

The coal strike in Cape Breton has upset all business in that district, and in fact is being felt all over the province. It is to be hoped that some arrangement will shortly be made with the British Empire Steel Company so that the men can go back to work.

Our old friend Jack Horgan is taking out the excavation of a new grain elevator at Halifax, Nova Scotia. They have a Model-21 Marion on the job, with Vic Rossi at the levers and Y. Mayes firing.

We had a visit last week from Tom Gorman of Gorman & Peckham, whom we reported last month as having been injured. We learned from him that he was hurt by a stray rock from a blast and he almost "cashed in." He is on the mend, however, and is at present taking a rest.

Toronto and Vicinity

BY C. F. ENGLAND

The Toronto Viaduct Scheme from all reports seems to be taking on a more actual aspect, and we hope before long to see construction work going.

It was with extreme regret we heard of the death of Mr. William Roy, superintendent of the Cooksville Shale Brick Company at Cooksville, Ontario. Mr. Roy was killed instantly at the plant during the early part of April.

We had a visit from Arthur Mackie the other day. Art has been handling the levers on a Bucyrus 20-B shovel for the Armstrong Whitworth Company on a job in the East.

The Jackson-Lewis Company of this city have recently secured the contract for a large office building for the Ontario Provincial Government.

Vancouver and Vicinity

BY J. C. MOON

The Canadian Pacific Railway Company has appropriated the sum of $3,500,000 for work in British Columbia this year. This is to cover new trackage facilities at Vancouver, besides ballasting, renewals and filling in of trestles, together with extensive improvements along the main line.

South Vancouver Municipality are commencing work on a large sewer project, and will expend about $150,000 in the present year.

Sanction has been given by the Provincial Government for the City of Vancouver to construct a tunnel to tap the water of Burwell Lake in connection with the improvements to the water system to be carried out this year.

The Esquimalt & Nanaimo Railway, in addition to general improvements on its main line, is building a branch line to Great Central Lake in connection with a large sawmill which is to be erected there.

Winnipeg and Vicinity

BY F. X. AMOSS

The Saskatchewan Government has let a contract for the improvement of the road between Seward and Webb, to J. E. Boivin of Winnipeg, and to Hett & Sibbald of Prince Albert for eight miles of the Provincial Highway between Yorkton and Canora.

It is expected that some action will be taken this year to prevent the annual spring floods of that portion of Manitoba lying to the northwest of Winnipeg. This may mean the construction of a large storm sewer or a big drainage ditch.

BUILDERS OF TRENCH EXCAVATORS FOR 30 YEARS

Buckeye NO "Weakest Link"

THIS applies not only to the digging chains—but equally well to all other details of Buckeye construction.

Take the steel used in these chains—in each link and each pin there is more than "just enough" steel, with the result that the chain will successfully withstand abuse incident to the wear and tear of the roughest digging.

This same rugged construction and performance ability is built right into Buckeyes throughout.

Gears are cut from steel blanks. Shafts are chrome and chrome nickel—high carbon. Roller chains are the best made.

And power? Nobody ever heard of a Buckeye quitting. They just keep right on digging—day in, day out, in all kinds of weather and in all kinds of soil.

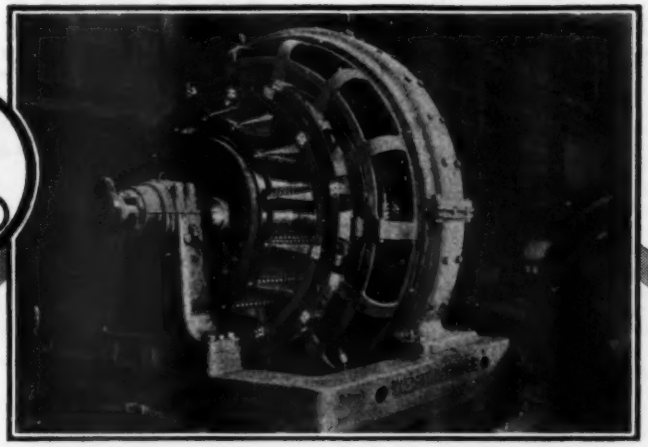
Ask any owner. Or, send for the Buckeye booklets.

The Buckeye Traction Ditcher Company

Findlay, Ohio

Manufacturers of Trench Excavators (both Wheel and Chain-and-Bucket Types), Pipe-Line Trench Excavators, Tile and Open Ditchers, Back-Fillers, Pipe Screwing Machines, Curb Diggers and Clay Diggers

THERE'S A BUCKEYE SALES AND SERVICE OFFICE NEAR YOU



For the Largest Electric Dredge Ever Built

THIS is the Westinghouse 2700 hp., QM motor just completed for the Dredge Clackamas at Portland, the largest electric dredge ever built. The motor will be direct connected to the large centrifugal pump supplying the powerful suction to a 30 inch pipe line up to 9,000 feet.

This is illustrative of the adaptability of the Westinghouse QM motors to the most severe dredging operations.

The QM motor represents the most advanced design in large d-c. motors, combining great mechanical strength with high electrical efficiency.

Distinctive characteristics of the QM motors are:

Thorough ventilation—no hot spots
Laminated steel poles—good commutation
Dustproof bearings—longer life
Close speed regulation

The combined engineering skill of the Westinghouse organization is behind the QM motor. Reliability is built into it.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of
the United States and Foreign Countries

Westinghouse

X 80636

For convenience in making inquiry use postal inserted in this number.

TRADE NOTES

The *Ingersoll-Rand Company* has recently announced a new lightweight reversible pneumatic wood-boring machine known as Size "DD," and is suitable for wood boring up to 1-inch diameter holes. This drill has an average speed of 705 r. p. m. and weighs 15 pounds. It is recommended to be driven for ½-inch hose. Further information may be obtained by addressing the *Ingersoll-Rand Company, 11 Broadway, New York.*

The *General Motors Truck Company* has recently announced a 1½-ton truck, completing a line of trucks with rated loads of from 1 to 15 tons. This new truck is equipped with four-wheeled brakes, three-point cushioned engine suspension, newly designed axles and many other improvements. Further information may be had from the *General Motors Truck Company, Pontiac, Michigan.*

The *Chicago Pneumatic Tool Company* have recently developed an air compressor, direct driven by a fly-wheel type synchronous motor. This machine, known as the Class N-SE, is available in sizes ranging from 139 to 1,000 cubic feet displacement for 100 pounds discharge pressure up to 125 pounds. The type of motor used has very low weight per horsepower, which adapts it very nicely for this use.

The American Cable Company announce the opening of a district office at 160 North La Salle Street, Chicago. Mr. W. H. Slingluff will handle sales of this company's Tru-lay wire rope, two lock settings, etc., in the Mid-Western states. Mr. Slingluff has been actively identified with the wire rope field for more than 26 years.

KOPPEL CARS

Koppel builds square box dump cars, V shaped dump cars of all types and capacities — track, frogs, switches, rails — all high-class equipment that will render long service.

Do you have our latest bulletins?

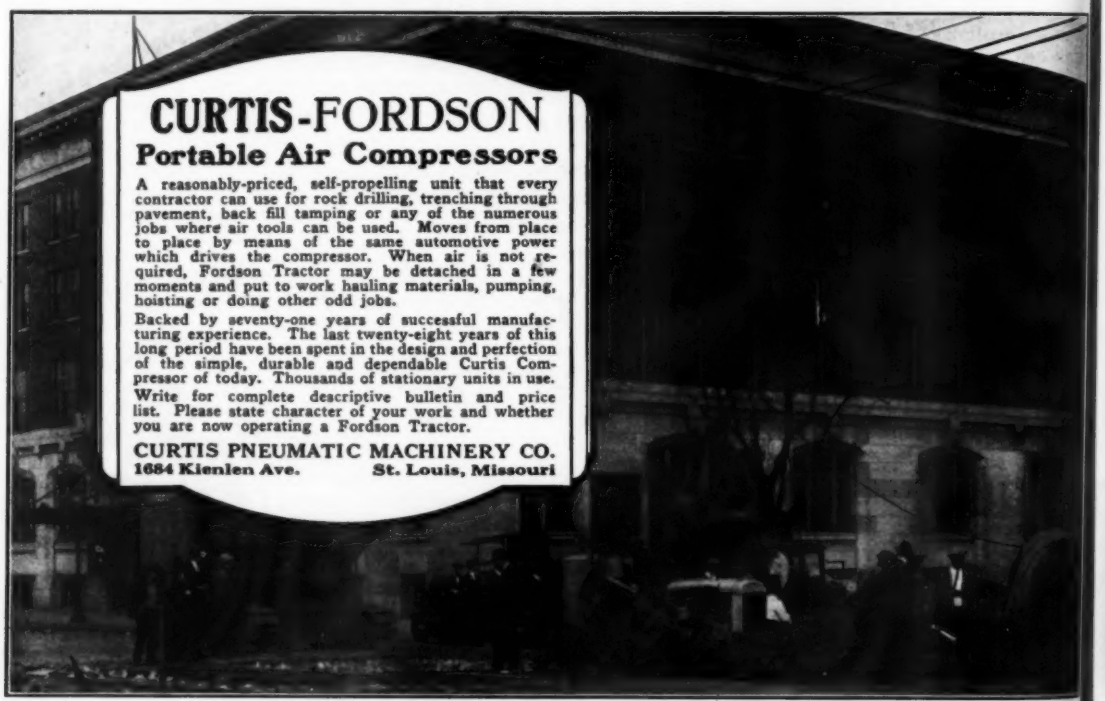
Frogs-Switches-and Rails

KOPPEL INDUSTRIAL CAR & EQUIPMENT CO

KOPPEL
NEW YORK
CHICAGO

KOPPEL

PENNA.
PITTSBURGH
SAN FRANCISCO



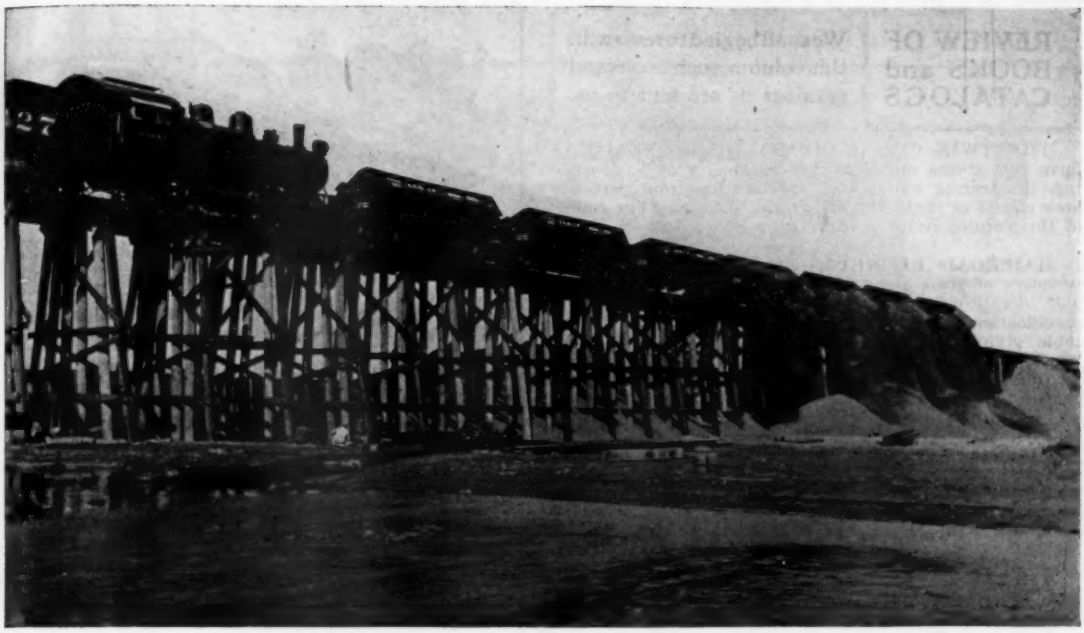
CURTIS-FORDSON
Portable Air Compressors

A reasonably-priced, self-propelling unit that every contractor can use for rock drilling, trenching through pavement, back fill tamping or any of the numerous jobs where air tools can be used. Moves from place to place by means of the same automotive power which drives the compressor. When air is not required, Fordson Tractor may be detached in a few moments and put to work hauling materials, pumping, hoisting or doing other odd jobs.

Backed by seventy-one years of successful manufacturing experience. The last twenty-eight years of this long period have been spent in the design and perfection of the simple, durable and dependable Curtis Compressor of today. Thousands of stationary units in use.

Write for complete descriptive bulletin and price list. Please state character of your work and whether you are now operating a Fordson Tractor.

CURTIS PNEUMATIC MACHINERY CO.
1684 Kienlen Ave. St. Louis, Missouri



Opening One Valve Dumps Hundreds of Tons

HUNDREDS of tons dumped at one time by the mere turning of a valve at the cost of a few extra strokes of the locomotive air pump. There's labor saving performance that can't be surpassed.

But the saving of labor is not all — think also of the great saving of time when the hundreds of tons slide over the down turned doors clearing the rails and cross ties.

This time and labor saving performance indicates with particular emphasis that the Extension Side Dump Car is the logical solution of the dumping problem in which exceptional savings and efficient service are fully co-ordinated.

CLARK CAR COMPANY

PITTSBURGH, PA.

NEW YORK OFFICE:
52 Vanderbilt Ave.

CHICAGO OFFICE:
122 South Michigan Ave.

For convenience in making inquiry use postal inserted in this number.

REVIEW OF BOOKS and CATALOGS

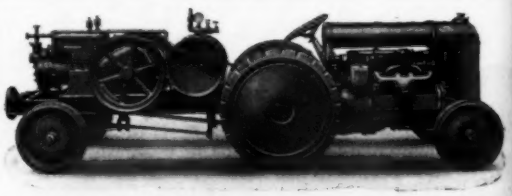
We shall be glad to review, in this column, such books and catalogs as are sent to us.

THE TWIN CITY COMPANY OF MINNEAPOLIS have just gotten out a 20-page catalog, 8 x 8¾, describing, illustrating and giving specifications and performance charts of their line of gasoline engines. For copies of this catalog write to the manufacturer.

RAILROAD BUCKETS — 8½ x 11, eight pages, descriptive of sizes and types of clamshell buckets adaptable to railroad work. The bulletin gives very complete specifications of the various sizes and types, including table giving the breaking strength and recommended working loads of wire rope. A copy may be had by writing *Blaw-Knox Company, Pittsburgh, Pennsylvania*, asking for their Form No. 884.

BARCO FLEXIBLE JOINTS — 8½ x 11, eight pages. This bulletin describes in detail, illustrates various uses for, and gives tables of size, etc., of Barco flexible joints for oil, steam or gasoline and water, etc., where a flexible conveyor is required. Write to *Barco Manufacturing Company, 1801 Winnemac Avenue, Chicago, Illinois*, for Catalog No. 201.

THE 7-S MIXER BOOK — 8½ x 11 inches, 16 pages with cover, splendidly illustrated. Describes 7-S Leach concrete mixers. Also results of tests recently conducted by Robert W. Hunt Company on different makes of concrete mixers. For your copy write the *Leach Company, Oshkosh, Wisconsin.*



100 Cubic Foot "SCHRAMM" Compressor-Tractor

WE WELCOME

the opportunity of demonstrating the "SCHRAMM" Compressor-Tractor on your job in competition with other compressor equipments. Will you give us this opportunity? It costs you nothing.

SCHRAMM, Inc.

Home Office and Factory — WEST CHESTER, PA.

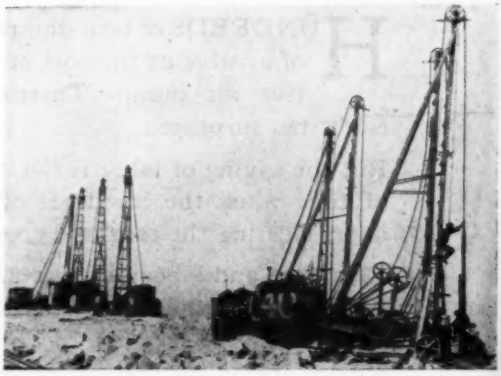
54 Dey Street, New York
331 Fourth Avenue, Pittsburgh
549 W. Washington Street, Chicago
709 Arch Street, Philadelphia

MAKING HARD ROCK "SOFT"

A few years ago, heavy rock moving jobs were side-stepped by contractors if there was anything better in sight. This was due to the grief and troubles encountered in drilling and blasting.

First, there were piston drills with their cumbersome equipment and contingent worries, such as freezing pipe lines, compressor breakdowns, bench cleaning and idle shovels. Later, light water well drills brought about a great improvement in the system of operation but the machines were not designed to stand the gaff.

Today, with Cyclone No. 14 Blast Hole Drills on the job, a heavy rock cut is no more difficult than an earth fill. The drills are designed for the work. They have cast steel operating parts which eliminate breakage and shutdowns which might tie up the whole job outfit.



The complete story of how *Cyclone Drills make hard rock "soft"* is told in our 100-page catalog B-45 entitled "Big Blast Hole Drills." Ask for a copy.

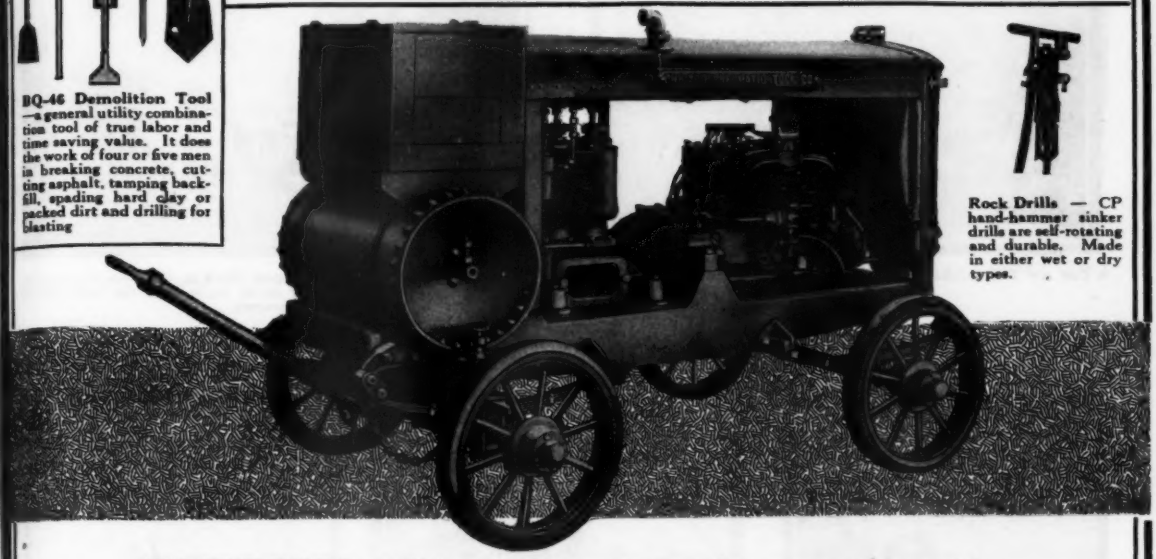
THE SANDERSON-CYCLONE DRILL COMPANY
Orrville, Ohio

EASTERN AND EXPORT OFFICE
30 CHURCH STREET, NEW YORK

For convenience in making inquiry use postal inserted in this number.

BQ-46 Demolition Tool—a general utility combination tool of true labor and time saving value. It does the work of four or five men in breaking concrete, cutting asphalt, tamping backfill, spading hard clay or packed dirt and drilling for blasting

Machine Efficiency—



Rock Drills — CP hand-hammer sinker drills are self-rotating and durable. Made in either wet or dry types.

HUNDREDS of Chicago Pneumatic portable compressors, with trench and highway equipment of CP air-power tools, are constantly being used to speed up work and reduce labor costs.

CP portable compressors, in sizes of 100 to 300 cu. ft., are built in gasoline or electric motor driven types mounted upon steel or rubber-tired wheels, CP trailers, motor trucks or skids.

These dependable compressors are directly connected to the engine or motor—no belts or gears being used. With such features as Simplate Valves, automatic regulation and self-lubrication—CP compressors insure the greatest attainable efficiency.

For convenient reference and complete information—write for bulletins.

J-188

Chicago Pneumatic Tool Co.

Sales and Service Branches all over the World

6 East 44th Street **New York, N. Y.**

A Cut and Fill on the New Railroad Line

The second Bucyrus 20-B to be erected moving to its work from the point where it was erected.

The First Machine to Be Erected Working in a Cut of White Sand

Erecting one of the revolving shovels. The boiler being hoisted into place is of the wood-burning type.

One of the shovels starting a narrow ... cut. Note how little room there is ... loading cars.

Three of the men on the job with a group of their "boys," at Lukussu. The man with the cane is M. Van Heck, who is operating one of the machines.

Views on the Relocation of the Matadi-Leopoldville Railway by the Societe Africaine de Construction